INDEX

CITATIONS

742-856 64 —1

Cases—Continued

In the Supreme Court of the United States

OCTOBER TERM, 1964

No. 20

WALTER C. BRULOTTE ET AL., PETITIONERS

v.

THYS COMPANY

ON WRIT OF CERTIORARI TO THE SUPREME COURT OF WASHINGTON

BRIEF FOR THE UNITED STATES AS AMICUS CURIAE

OPINIONS BELOW

The opinion of the Supreme Court of the State of Washington (R. 106–114) is reported at 162 Washington 2d 284, 382 P. 2d 271. The memorandum opinion of the Supreme Court in and for Yakima County (R. 82–89) and its findings of fact and conclusions of law (R. 92–100) are unreported.

JURISDICTION

The judgment of the Supreme Court of the State of Washington (Department One) was entered on October 4, 1963 (R. 115). A petition for rehearing *en banc* was denied on October 4, 1963 (R. 116). The petition for a writ of certiorari was filed on December 26, 1963, and was granted on February 17, 1964 (R. 116; 376 U.S. 905).

The jurisdiction of this Court is conferred by 28 U.S.C. 1257(3).

CONSTITUTIONAL PROVISION AND STATUTES INVOLVED

Article I, Section 8 of the Constitution of the United States provides:

> The Congress shall have Power * * * [Clause 8] [t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

The pertinent provisions of the United States Patent Code, Title 35 U.S.C., are as follows:

> Section 101. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
>
> Section 154. Every patent shall contain a short title of the invention and a grant to the patentee, his heirs or assigns, for the term of seventeen years, of the right to exclude others from making, using, or selling the invention throughout the United States, referring to the specification for the particulars thereof. * * *

QUESTION PRESENTED

The United States will discuss the following question, which, it submits, is comprehended by the two questions as to which the Court granted certiorari:[1]

[1] Those two questions are (R. 116–117):

1. Whether it is a misuse to include in a license agreement a provision which perpetuates the monopoly of a licensed patent by a requirement that royalties be paid for the use of the in-

Whether, in a patent licensing agreement, a patentee may require the payment of royalties for the use, after his patents have expired, of a machine which incorporates mechanisms covered by such patents.

INTEREST OF THE UNITED STATES

The issue in this case is whether a patentee may require the payment of royalties for use of a patented machine after the patents upon the mechanisms in the machine have expired. The patent laws give a patentee the exclusive right to exploit his invention for 17 years; after that period has passed, however, the patent passes into the public domain, where the invention may be practiced by all without charge. The United States is concerned that permitting a patentee to collect royalties for use of a patent after it has expired would constitute an unwarranted extension of the limited monopoly which the patent laws permit, and, therefore, would be detrimental to our basic federal policy of free competition.

STATEMENT

The Thys Company ("Thys") held numerous patents relating to hop picking machines. It arranged for the manufacture of portable machines embodying certain of those patents and then sold the machines to farmers. Under the sales agreement the purchas-

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vention after the patent has expired and the invention had been dedicated to the public.

2. Whether it is a misuse or an antitrust violation to include in a license agreement a provision which extends the monopoly of a patent to unpatented subject matter by a provision which requires the payment of post-expiration royalties.

ers paid Thys a flat sum and received title to the machine, but could use it only pursuant to a license set forth in the purchase agreement. (R. 42, 43, 74, 78, 107, 109.) The license listed certain patents covering the mechanisms in the machine, and also stated "Other Patents Pending" (R. 71, 79). It provided for royalty payments of $3.33\frac{1}{3}$ per two hundred pounds of dried hop harvested by the machine, with a minimum royalty of $500 per machine for each hop picking season. Payments were to be made for seventeen years from the date of purchase. The agreement also provided that without Thys' permission, the purchaser could not sell his machine or permit it to be moved to another county, or assign his interest in the licensing agreement (R. 71, 79).

The Brulottes and the Charvets (the petitioners here) purchased their Thys machines from prior purchasers on August 10, 1948, and January 31, 1951, respectively (R. 71, 79, 94). They signed form sales agreements furnished by Thys which were substantially the same as the original Thys sales agreement (R. 54, 55). Under the agreements the owners of the machines sold them to the Brulottes and the Charvets, and Thys licensed use of the machines until the expiration of the seventeen-year period provided for in the original sales agreements (R. 71, 79). Thus the Brulottes were obligated to pay royalties until the end of the 1958 harvest season and the Charvets until the end of the 1960 season.

The form agreements listed 12 patents relating to hop picking machines, but only seven of them covered

mechanisms incorporated into the machines purchased by the Brulottes and Charvets (R. 95).[2] All but one of the listed patents expired in 1955 or 1957 (R. 71, 79). The patent whose term was as long as the license agreements (U.S. Patent Number 2,336,280) covers a mechanism not incorporated in the machine (R. 56). The license agreements also referred to "Other Patents Pending" (R. 71, 79). One patent application was pending when the Brulottes and the Charvets entered into the agreements with Thys; the patent which later issued on this application does not expire until 1969. A second patent application was pending when the Charvets purchased their machine and a third was pending at the time that the Brulottes purchased their machine. The patent issuing on this third application was later declared invalid (R. 95).

Neither the Brulottes nor the Charvets made payments after 1952 (R. 94). Thys brought suit in a Washington State Court against the Brulottes in 1959, and against the Charvets in 1960 to recover royalties allegedly due under the license agreements. Among the defenses which petitioners raised was the claim that Thys had misused its patents by attempting to extend the royalty payments beyond the expiration date of the listed patents which covered improvements incorporated in the machines (R. 110). The trial court

[2] Two of the patents listed were subsequently held invalid: No. 2,114,712 in *E. Clemens Horst Co.* v. *Oeste*, 114 F. Supp. 408 (N.D. Cal.), and No. 2,226,009 in *Thys Co.* v. *Oeste*, 111 F. Supp. 665 (N.D. Cal.), affirmed, 219 F. 2d 131 (C.A. 9), certiorari denied, 349 U.S. 946.

rejected this as well as all other defenses, and rendered judgment in favor of Thys (R. 86–89). The Supreme Court of the State of Washington affirmed, holding on this issue that since the parties "understood between them that a 17-year period was a reasonable amount of time over which to spread the payments for the use of the patent * * * [t]here is no legal or equitable reason why they should not be required to perform their agreement" (R. 112).

SUMMARY OF ARGUMENT

The patent laws give a patentee for 17 years the exclusive right to exploit his invention. The limited duration of the patent grant is an essential element of the patent system, and "on the expiration of a patent the monopoly created by it ceases to exist, and the right to make the thing formerly covered by the patent becomes public property" (*Singer Mfg. Co.* v. *June Mfg. Co.*, 163 U.S. 169, 185). The Court repeatedly has condemned attempts to continue the patent monopoly, in any form or degree, after the patent has expired.

The licensing agreement in this case requires the payment of royalties based upon use of the patented machine after the patents which it utilizes have expired. Such an agreement constitutes a forbidden attempt by a patentee to extend its patent monopoly beyond the limited term for which it is granted. For once the patent has expired, the invention which it covers is in the public domain; and the patentee

cannot thereafter charge the public royalties for the right to practice the invention.

Contrary to the view of the Supreme Court of Washington, payment of royalties for use of the machine after the patent has expired cannot be justified as a convenient method of spreading over a reasonable time the payments for use of the patent. For the amount of the payments depends upon how much the machine is used, and when the licensee pays royalties after the patent has expired, he is being required to pay for the right to practice an invention that has passed into the public domain.

ARGUMENT

A PATENTEE MAY NOT REQUIRE, IN A PATENT LICENSING AGREEMENT, THE PAYMENT OF ROYALTIES FOR THE USE, AFTER HIS PATENTS HAVE EXPIRED, OF A MACHINE WHICH INCORPORATES MECHANISMS COVERED BY SUCH PATENTS

1. The Patent and Copyright Clause of the Constitution authorizes Congress "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries" (Art. I, § 8, cl. 8). By its terms, the clause allows the grant of exclusiveness only for original creative contributions, and only "for limited Times." In the patent laws, Congress has defined these limitations upon "the exclusive Right" to exploit inventions: A

patent may be granted for a "new and useful" product for 17 years, during which period no one may make, use or sell the patented product in the United States without the authority of the patentee (35 U.S.C. 101, 154, 271).

"Since patents are privileges restrictive of a free economy, the rights which Congress has attached to them must be strictly construed so as not to derogate from the general law beyond the necessary requirements of the patent statute" (*United States* v. *Masonite Corporation,* 316 U.S. 265, 280). The limited duration of the grant is an essential element of the patent system. The inventor is given the exclusive right to practice his invention for 17 years, but "on the expiration of a patent the monopoly created by it ceases to exist, and the right to make the thing formerly covered by the patent becomes public property," which all may enjoy without charge. *Singer Mfg. Co.* v. *June Mfg. Co.,* 163 U.S. 169, 185; *Kellogg Co.* v. *National Biscuit Co.,* 305 U.S. 111, 117–120. To insure that the public ultimately will have the right fully to practice the invention, the patent laws further require "full disclosure for the benefit of the public of the manner of making and using the invention" (*Scott Paper Co.* v. *Marcalus Co.,* 326 U.S. 249, 255).

This Court has repeatedly condemned attempts to continue the patent monopoly, in any form or degree, after the patent has expired. Thus, upon expira-

tion of the patent the patentee cannot protect the good will that has attached to the distinctive shape of the patented product during the life of the patent; to permit it to prevent others from producing the product in that shape would enable it to extend benefits of the patent monopoly beyond the period provided by Congress. *Kellogg Co.* v. *National Biscuit Co., supra.* Where, during the time the patents were in force, the name of the manufacturer acquired a generic meaning covering a particular type of product, the manufacturer was not permitted, after the patents had expired, to enjoin others from using that name. *Singer Mfg. Co.* v. *June Mfg. Co., supra.* For when a patent expires, the patented product falls "into the domain of things public"; and the public acquires the right to make the goods and to do whatever is necessary for their "full enjoyment," including the right to "use the name in every form" even if it was originally the surname of the patentee. Otherwise, the patentee could in effect "disregard the public dedication and practically perpetuate indefinitely an exclusive right." *Id.*, at 185–186.

In *Scott Paper Co.* v. *Marcalus Co.*, 326 U.S. 249, the Court held that an assignor of a patent might defend a patent infringement suit on the ground that the assigned patent claimed an invention covered by a prior expired patent and was therefore invalid. The Court ruled that to permit an estoppel—even as against the assignor who had received full compensa-

tion from the plaintiff—would be improper, for it would result in hampering the free use of the invention after the patent had expired. It stated (326 U.S. at 256–257):

> * * * the patent laws preclude the patentee of an expired patent and all others including petitioner from recapturing any part of the former patent monopoly; for those laws dedicate to all the public the ideas and inventions embodied in an expired patent. They do not contemplate that anyone by contract or any form of private arrangement may withhold from the public the use of an invention for which the public has paid by its grant of a monopoly and which has been appropriated to the use of all. The rights in the invention are then no longer subject to private barter, sale or waiver.

2. The licensing agreements in the present cases require the payment of royalties based upon use of the patented machine after all the patents which the machine utilizes have expired. Under the agreements the Brulottes were required to pay royalties through the 1958 harvesting season, and the Charvets through the 1960 season (R. 71, 79). Although the form licenses listed twelve patents relating to hop picking systems which the machines utilized, only seven of them covered mechanisms actually incorporated into the machines which the Brulottes and the Charvets acquired (R. 95). All of these seven patents expired in 1955 or 1957 (R. 71, 79). Another patent (U.S. Patent No. 2,336,280, R. 56), which expired in December, 1960, covered an invention not incorporated in

the machine: a hop cluster stemmer, which is a mechanical device to salvage hops from clusters which become separated from vines. (R. 56. This patent is reprinted in Appendix A.) The license to use this hop cluster stemmer was of no direct use to the purchasers of the hop-picking machine, since it was not a part of the machine, and there is no indication that any part of the royalties represented compensation for this patent. As the trial court stated (R. 87); "If any patents were included which were not needed in the use of the machines, they were mere surplusage and there is no evidence from which the court might conclude that any special value was placed upon any of the patents which were not incorporated in the machines." It is thus plain that the royalties which the petitioners were obligated to pay were for the use of the seven patents that expired in 1955 or 1957.

3. The question in this case, therefore, is whether, consistent with the limited scope of the patent monopoly, a patentee may require in a patent licensing agreement the payment of royalties based on the use of the patented device after the patent has expired. We submit that he may not. For once the patent has expired, the invention which it covers is in the public domain; and to allow the patentee to obtain payments for its continued use would be to perpetuate the patent monopoly beyond the limited time prescribed by Congress. Stated differently, the effect would be to enable the patentee to continue to enjoy the benefits of his monopoly after it had expired.

To be sure, had the machine been unpatented the parties, if permitted by State law, could have entered

into an agreement for its sale on precisely the same terms. But the fact that the machine was patented constitutes a critical difference and compels a contrary result. Since the owner of a patent is granted by federal law the exclusive right to exploit his invention for a limited time, he is in a far stronger bargaining position during that period vis-à-vis prospective users of the patent than the owner of an unpatented product. For while the patent is in force those who wish to use it have no alternative but to deal with the patentee, and, if the product is in demand, he is able to impose severe terms and conditions, as to which there is unlikely to be any realistic bargaining. But this exclusivity feature also has its price: once the period of exclusivity is over, the patentee cannot in any way continue to reap the benefits of his monopoly.

When Thys licensed the petitioners to use the machines, it was the only source to which petitioners could turn if they wanted a portable hop-picking machine.[3] It was the existence of this monopoly power, resting upon the patents, that enabled Thys to require its licensees, as a condition of obtaining the machines, to agree to pay royalties for the use of the machines not only during the life of the patents, but even beyond. The situation thus is analogous to the numerous cases in which this Court has struck down attempts by a patentee to tie the sale or use of patented products to the purchase or use

[3] Indeed, the record shows (R. 49) that since 1941 Thys was the only source of portable hop-picking machines in the United States.

of unpatented ones;[4] both situations involve a forbidden attempt by a patentee to extend the patent monopoly beyond the limited scope which Congress has given it. It is therefore not surprising that, although the cases are in disagreement,[5] there is persuasive authority condemning, as a patent misuse, the attempted "exaction of royalties" for use of a machine after the patent utilized therein has expired. *Ar-tik Systems, Inc.* v. *Dairy Queen, Inc.*, 302 F. 2d 496, 510 (C.A. 3); *American Securit Co.* v. *Shatterproof Glass Corp.*, 268 F. 2d 769, 777 (C.A. 3), certiorari denied, 361 U.S. 902; *Technograph Printed Circuits, Ltd.* v. *Bendix Aviation Corp.*, 218 F. Supp. 1, 48–49 (D. Md.), affirmed on other grounds, 327 F. 2d 497 (C.A. 4), pending on petition for certiorari, No. 176, this Term; cf. *Baker-Cammack Hosiery Mills* v. *Davis Co.*, 181 F. 2d 550, 573 (C.A. 4), certiorari denied, 340 U.S. 824.[6]

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[4] *E.g., Ethyl Gasoline Corp.* v. *United States*, 309 U.S. 436; *B.B. Chemical Co.* v. *Ellis*, 314 U.S. 495; *Mercoid Corp.* v. *Mid-Continent Inv. Co.*, 320 U.S. 661.

[5] The contrary authorities are cited by the Supreme Court of Washington, R. 111. In general, they do not focus on the point, developed in the text, that the exaction of post-expiration royalties constitutes a misuse of patents, and treat the problem as one of general contract law.

[6] The respondent cannot justify its imposition of royalties after the patents used in the machine had expired by the facts that (1) the form sales-and-license agreement also covered "Other Patents Pending" (R. 71, 79), of which there were three when the petitioners purchased their machines (R. 95); and (2) these "patents pending" issued during the life of the patents used in the machines and were still in effect upon the expiration of the 17-year period for royalties. For, as the trial

To this it may be answered, as did the Supreme Court of Washington (R. 111, 112), that the sale and royalty agreements in this case involved no improper extension of the patent monopoly, but only an understanding "that a 17-year period was a reasonable amount of time over which to spread the payments for the use of the patent." If that were all the parties had done, we agree that the respondent would not have gone beyond the proper scope of its patent rights. For example, if the parties had agreed (1) that a fair price for the machine was $8,500, and (2) that such amount should be paid over a 17-year period at the annual rate of $500, there would be no problem.

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court ruled (R. 82), "the record is inconclusive as to whether or not they were in fact used or incorporated into the machines." If the subsequently issued patents were not used in the machines, they could not possibly sanction the imposition of royalties for use of the machines after the patents which it incorporated had expired. But even if they were incorporated in the machines, this would not aid respondent. For the applications for the patents were all filed more than one year after Thys initially had sold the machines to the farmers who resold them to petitioners (R. 57, 60, 62). As Appendix B we attach copies of the title pages of the relevant patents, and 35 U.S.C. 102(b) provides that a patent may not be granted if the invention claimed has been used or sold in the United States more than one year prior to the date of the application. Finally, since a mere application for a patent gives the applicant no patent rights enforceable against third persons, a patentee cannot rely on a "patent pending" to define or expand his rights under his existing patents. Nordhaus and Jurow, *Patent-Antitrust Law*, § 38; *United States* v. *National Lead Co.*, 63 F. Supp. 513, 523–524 (S.D.N.Y.), affirmed, 332 U.S. 319; cf. *Tate* v. *Lewis*, 127 F. Supp. 105 (D. Mass.); *Ethyl Gasoline Corp* v. *United States*, 309 U.S. 436.

In fact, however, the agreements under which the machines were sold were not limited to a sale at a fixed price, the payment of which was spread over a designated period. On the contrary, the sales price comprised two elements: (1) a relatively small amount determined and paid in advance; and (2) a flexible balance to be paid over 17 years, the amount of which depended upon the use that would actually be made of the machine, with a minimum annual payment—expressly described as a "royalty" (R. 71, 79)—of $500.[7] By thus being required to pay Thys royalties based on their use of the patented machine after the patents had expired, the petitioners were being required to pay for the right to practice an invention that had passed into the public domain. As we have shown, however, the patent laws require that, upon the expiration of the term of the patent, the invention must be dedicated to the public.

Automatic Radio Manufacturing Co., Inc. v. *Hazeltine Research, Inc.*, 339 U.S. 827, upon which respondent relies (Br. in Opp., 10–12), does not establish the validity of such payments. That case involved the legality of a license covering all of the licensor's patents, in return for royalty payments of

[7] If royalty payments on a particular machine exceeded $500, the excess was not credited toward the minimum payment due on any other machine (R. 74, 78). The Charvets did not use the machine at all after 1952; they were, however, required to pay the minimum royalties for those years (R. 97). The Brulottes were required to pay royalties for use in excess of the minimum for four years (R. 101).

a percentage of the licensee's sales, with a minimum amount. The royalties were payable without regard to the number of the patents which the licensee used; indeed, they accrued even if none was used. This Court held (p. 834) that "in licensing the use of patents to one engaged in a related enterprise, it is not *per se* a misuse of patents to measure the consideration by a percentage of the licensee's sales." The lower courts had both treated the licensing agreement as "a convenient mode of operation designed by the parties to avoid the necessity of determining whether each type of petitioner's product embodies any of the numerous Hazeltine patents" (p. 833), and the rationale of this Court's decision was its ruling (p. 834) that "[s]ound business judgment could indicate" that "payment of royalties according to an agreed percentage of the licensee's sales * * * represents the most convenient method of fixing the business value of the privileges granted by the licensing agreement." In the present case, however, as we have shown, the requirement that the petitioners pay royalties for the use of the machine after the patents had expired was not merely a "convenient method of fixing the business value of the privileges granted by the licensing agreement"; on the contrary, it was an attempt to secure for the respondent the benefits of its patent monopoly after the patents had expired.

4. The obligation in the licensing agreements to pay royalties after the patents have expired is coupled with other limitations which together have serious

anticompetitive consequences. The agreements prohibit the purchasers of the machine from reselling them without the respondent's consent.[8] As the present case demonstrates, the respondent apparently requires, as a condition to consenting, that the subsequent purchasers assume the obligation to pay royalties for the balance of the 17-year period. This restriction inevitably makes it more difficult for the initial purchasers of the machines to dispose of them, with the consequent blocking of the development of a market for second-hand machines. Thus, when the patents have expired and the used machines otherwise would be readily tradeable, respondent's restrictive patent-licensing conditions protect it from the competition of used machines.

Moreover, other manufacturers who attempted to manufacture and sell the machine after respondent's patents had expired would be under a serious handicap because of the obligation which respondent had imposed on its customers to pay a minimum annual royalty of $500, whether or not they use the machine. For even though the new machine was better than respondent's, the minimum royalty requirement would (1) make it difficult for the new manufacturer to sell its product to the group that would be most familiar

[8] Such a restraint on alienation, even of a patented product, is unlawful. *Dr. Miles Medical Co.* v. *Park & Sons Co.*, 220 U.S. 373, 404; *Adams* v. *Burke*, 17 Wall. 455; *Straus* v. *Victor Talking Machine Co.*, 243 U.S. 490; *United States* v. *Univis*, 316 U.S. 241.

with the product, and (2) discourage that group from substituting a superior product.

5. It therefore follows that the trial court erred in rejecting the petitioners' affirmative defense of patent misuse based upon the imposition of royalties for use of the machines after the patents had expired. Apparently no question has been raised whether respondent's patent misuse bars it from collecting any royalties for use of the machines, or only royalties accruing after the patents expired.

CONCLUSION

For the foregoing reasons the judgment of the Supreme Court of Washington should be reversed.

Respectfully submitted.

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SEPTEMBER, 1964.

APPENDIX A

Dec. 7, 1943. G. E. MILLER 2,336,280

HOP CLUSTER STEMMER

Filed Sept. 18, 1942 2 Sheets-Sheet 1

Fig. 1.

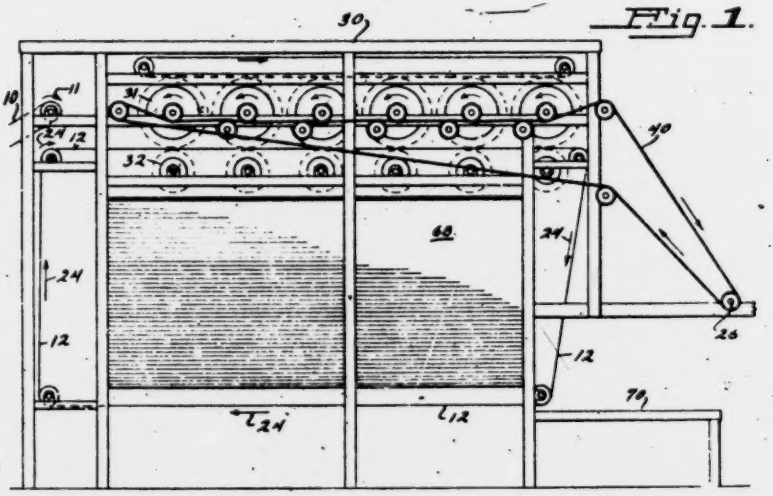
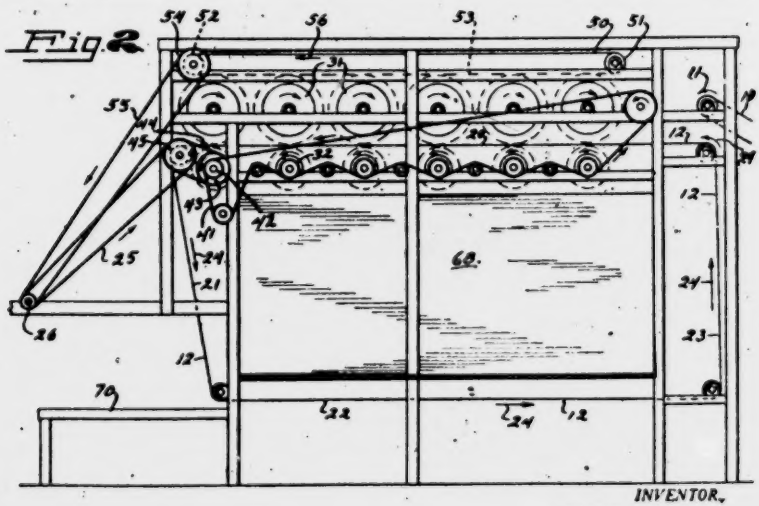


Fig. 2



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Dec. 7, 1943. G. E. MILLER 2,336,280

HOP CLUSTER STEMMER

Filed Sept. 18, 1942 2 Sheets-Sheet 2

Fig. 3.

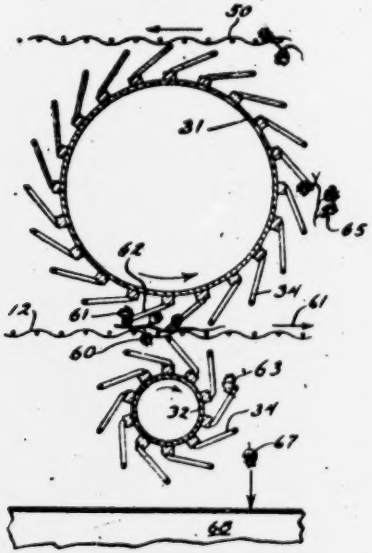


Fig. 4.

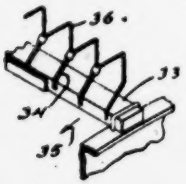
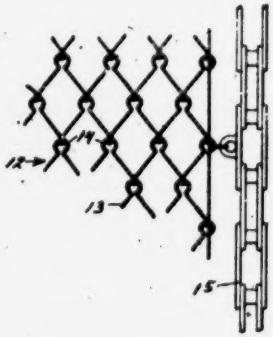


Fig. 5.



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Patented Dec. 7, 1943 2,336,280

UNITED STATES PATENT OFFICE

2,336,280

Hop Cluster Stemmer

George E. Miller, Fair Oaks, Calif., assignor to E. Clemens Horst Company, San Francisco, Calif., a corporation of New Jersey

Application September 18, 1942, Serial No. 458,793

4 Claims. (Cl. 130—30)

This invention relates to hop picking machines.

Hops grow on vines which are trained vertically on strings attached to horizontal wires suspended about eighteen feet above the ground. At harvest time the vines are pulled down and hauled to a plant where they are run through a machine which picks the hops from the vines. The picked hops are then separated from the leaves, etc.

From the time the vine is pulled down in the hop field to the time it is fed into the picking machine, it receives considerable handling in the course of which clusters become detached from the vine. A cluster comprises an arm or branch of the vine bearing a cluster of hops. Heretofore the only satisfactory way to salvage the hops on these clusters was to pick them off by hand—an expensive, laborious task.

The object of this invention is to provide a machine for doing this work.

A machine in which the invention is embodied is disclosed in the drawings in which:

Fig. 1 is a schematic side elevation of the machine.

Fig. 2 is an elevation of the opposite side of the machine.

Fig. 3 is a vertical section through a pair of finger drums.

Fig. 4 is a fragmentary perspective of a finger bar.

Fig. 5 is a fragmentary plan of a screen.

The clusters are collected and deposited on a conveyor 10 (Fig. 1) which discharges them as indicated by the arrow 11 on an endless feed belt or conveyor 12 which is constructed as shown in Fig. 5.

The central part of the conveyor on which the clusters are deposited is made of diamond mesh screen 13 hinged as indicated at 14, Fig. 5. The screen 13 is supported and carried by a pair of chains, one of which is shown at 15.

Referring to Fig. 2, the screen conveyor 12 has a horizontal upper stretch 20, a downwardly and inwardly inclined stretch 21, a horizontal lower stretch 22, and a vertical stretch 23. The conveyor is moved in the direction of the arrows 24 by a drive chain 25 which transmits power from a suitable power shaft 26.

Suitably journalled in the frame 30 are a series of upper finger drums 31 and a series of lower finger drums 32. Each drum has a plurality of transverse finger bars 33 (Fig. 4), of conventional construction. The fingers 34 are made of wire and are bent rearwardly with respect to their direction of movement indicated by the arrow 35. Adjacent fingers converge in a V, as shown at 36, in the same manner as the fingers of the human hand. In fact, when the hops are manually picked they are snared between the fingers with a raking motion of the hand. Hence the term finger.

Means are provided for rotating the finger drums. The upper drums 31 (Fig. 1) are rotated in the direction of the arrows thereon by means of a sprocket chain 40 driven from power shaft 26. The lower

drums 32 are rotated in the direction of the arrows thereon (Fig. 2) by a sprocket chain 41 which engages a drive sprocket 42 which is driven in unison with a sprocket 43 by a chain 44 from a sprocket 45 which is driven by the chain 25 from the power shaft 26. The drums 31 and 32 are arranged in pairs, the axes of each pair lying in a vertical plane perpendicular to the horizontal stretch 20 of the screen conveyer 12. The upper and lower drums rotate in opposite directions and in the direction of feed of the conveyer 12.

An endless screen belt 50 (Fig. 2) having the same construction as the conveyer 12 passes around sprockets 51, 52, and has a horizontal stretch 53 above the upper drums 31. The belt 50 is driven by means of sprocket 54 and chain 55 from power shaft 26 in the direction of the arrow 56 so that the stretch 53 adjacent the drums moves in the same direction as the fingers thereon.

It is an important feature of the invention that the screens move in the same direction as the fingers adjacent thereto, and further, that the peripheral speed of the drums, or the linear speed of the fingers, exceeds the linear speed of the screens as will now be explained by reference to Fig. 3.

The clusters which may be lying in any position on the screen conveyer 12 become entangled therein as will be apparent. The cluster readily engages with the screen on account of the fact that it is in a wilted condition so that some of the hops such as shown at 60 tend to droop down through the apertures of the screen 12.

The screen 12 feeds the clusters in the direction of the arrow 61 between a pair of drums 31, 32 which are rotating in the direction of the arrow thereon. The parts are arranged as shown so that the fingers

34 pass close to the screen. The hops are picked from the cluster by the fingers. A hop, such as 61, is snared by the finger 62 in the upper drum and, because the finger is moving faster than the screen and the cluster is caught in the screen, is snapped off by the finger. A hop, such as shown at 60, which hangs down from the screen will be snared by one of the fingers in the lower drum and snapped off. A hop picked by the lower drum is shown at 63.

In the event a cluster, such as shown at 65, is pulled off the screen 12 it is thrown or carried up against the upper screen 50 where the fingers cooperate with the upper screen to perform the picking operation. Thus, it will be seen that the lower screen 12 acts as a feeding and positioning means and the upper screen performs a similar function and in addition prevents the clusters from being thrown out of the machine by the rapid rotation of the upper drums 31.

Hops picked by the upper finger drum fall down through the apertures in the screen and hops picked by the lower drum also fall downwardly therefrom. A picked hop is shown at 67. It falls down against a baffle 68. The baffle 68 (Figs. 1 and 2) extends the length of the machine and underlies the finger drums. The baffle is inclined. In Fig. 1 the under side of the baffle appears which in Fig. 2 is seen the surface of the baffle on which the hops fall. They roll down the baffle appears while in Fig. 2 is seen the surface of shown) which removes them from the machine. The baffle and conveyer for collecting the picked hops may be of a construction and arrangement conventional in hop-picking machines. The arms and remaining parts of the clusters are discharged from the conveyor 12 by falling out of the conveyor in the inwardly inclined stretch 21, the material collecting on a table 70.

What I claim is:

1. A hop cluster stemmer which comprises, in combination, a horizontally disposed traveling screen for supporting and for conveying the clusters, said screen provided with diamond mesh openings, a series of picker drums disposed immediately above and adjacent to the screen, a second series of picker drums disposed immediately below and adjacent to the screen, each drum of both series carrying V-shaped picker fingers, means to revolve the drums so that the fingers sweep over the upper and lower surfaces of the screens substantially tangential thereto and in the same direction of travel of the screen, and means to rotate the drums so that the fingers travel at greater speed than the screen.

2. A hop cluster stemmer which comprises, in combination, a horizontally disposed traveling screen for supporting and for conveying the clusters, said screen provided with diamond mesh openings, a series of picker drums disposed immediately above and adjacent to the screen, a second series of picker drums disposed immediately below and adjacent to the screen, each drum of both series carrying V-shaped picker fingers, means to revolve the drums so that the fingers sweep over the upper and lower surfaces of the screens substantially tangential thereto and in the same direction of travel of the screen, means to rotate the drums so that the fingers travel at greater speed than the screen, a second mesh screen disposed immediately above and tangential to the arcs of travel of the outer ends of the fingers in the upper series of drums, and means to drive said second screen with its under stretch adjacent to the picker drums in the same direction as the adjacent fingers but at a slower rate of speed than said fingers.

3. A hop cluster stemmer comprising, in combination, two horizontally disposed, parallel spaced screen

conveyers with diamond mesh openings, means to cause the lower plane of the uppermost conveyer to travel in a direction opposite to the upper plane of the lowermost conveyer and each traveling at the same speed, a series of horizontally disposed picker drums arranged between the lower plane of the upper conveyer and the upper plane of the lower conveyer, said drums having picker fingers arranged approximately tangential to the adjacent surfaces of both screens, and means to revolve the drums so that the fingers travel in the same direction as, but at greater speed than, the adjacent plane of the lower screen.

4. A hop cluster stemmer comprising, in combination, two horizontally disposed, parallel spaced screen conveyers with diamond mesh openings, means to cause the lower plane of the uppermost conveyer to travel in a direction opposite to the upper plane of the lowermost conveyer and each traveling at the same speed, a series of horizontally disposed picker drums arranged between the lower plane of the upper conveyer and the upper plane of the lower conveyer said drums having picker fingers arranged to move in arcs approximately tangential to the adjacent surfaces of both screens, means to revolve the drums so that the fingers travel in the same direction as, but at greater speed than, the adjacent plane of the lower screen, a second series of picker drums arranged below and adjacent to the upper plane of the lowermost screen, and means to revolve that series of drums in the ame direction as said screen plane and at a peripheral speed in excess of the rate of travel of the screen.

GEORGE E. MILLER.

APPENDIX B

EXHIBIT 22

June 3, 1952 E. THYS 2,599,080

HOP PICKING MECHANISM

Filed Oct. 24, 1947

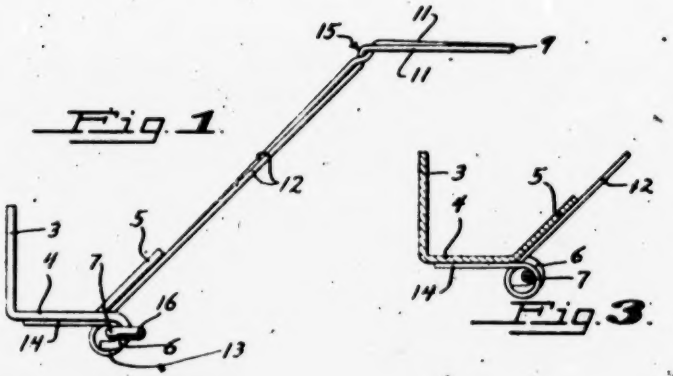

Fig. 1.

Fig. 3.

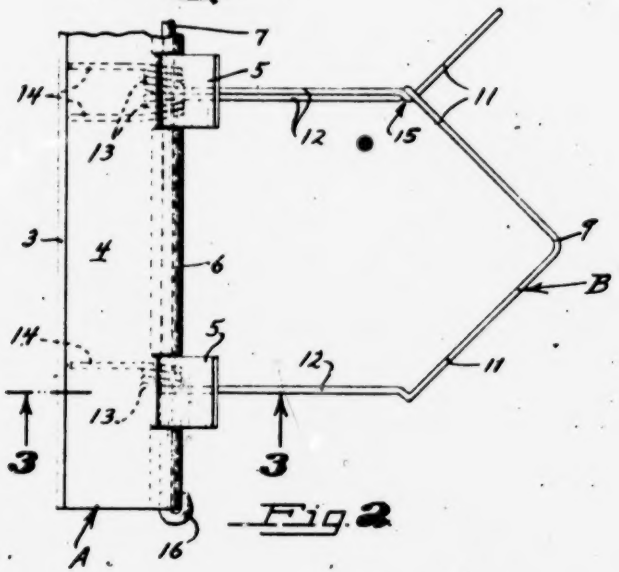

Fig. 2

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EXHIBIT 23

Aug. 31, 1948. E. THYS 2,446,663

MACHINE FOR STRIPPING HOPS FROM VINES

Filed Aug. 28, 1944

Fig. 1.

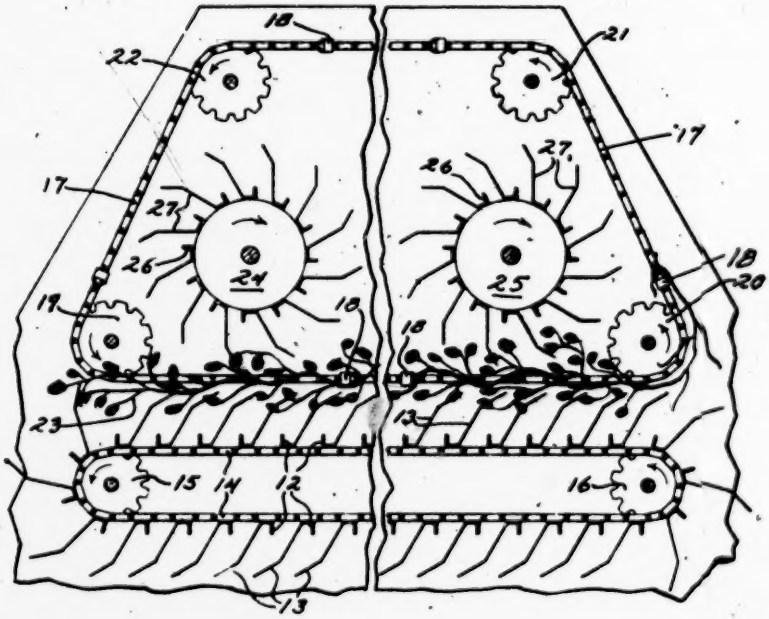

Fig. 2.

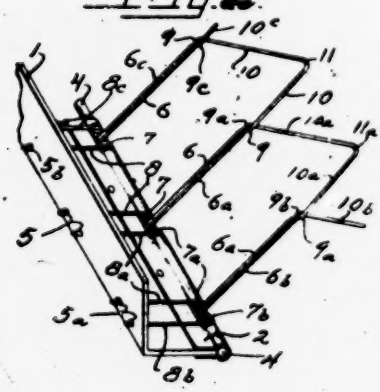

Fig. 3.

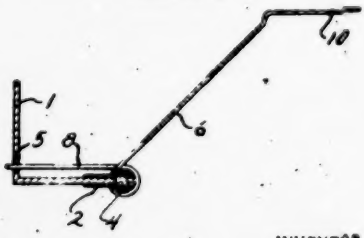

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EXHIBIT 25

Aug. 4, 1953 E. THYS 2,647,626

HOP STEM SEPARATOR

Filed Jan. 26, 1951 2 Sheets-Sheet 1

Fig. 1

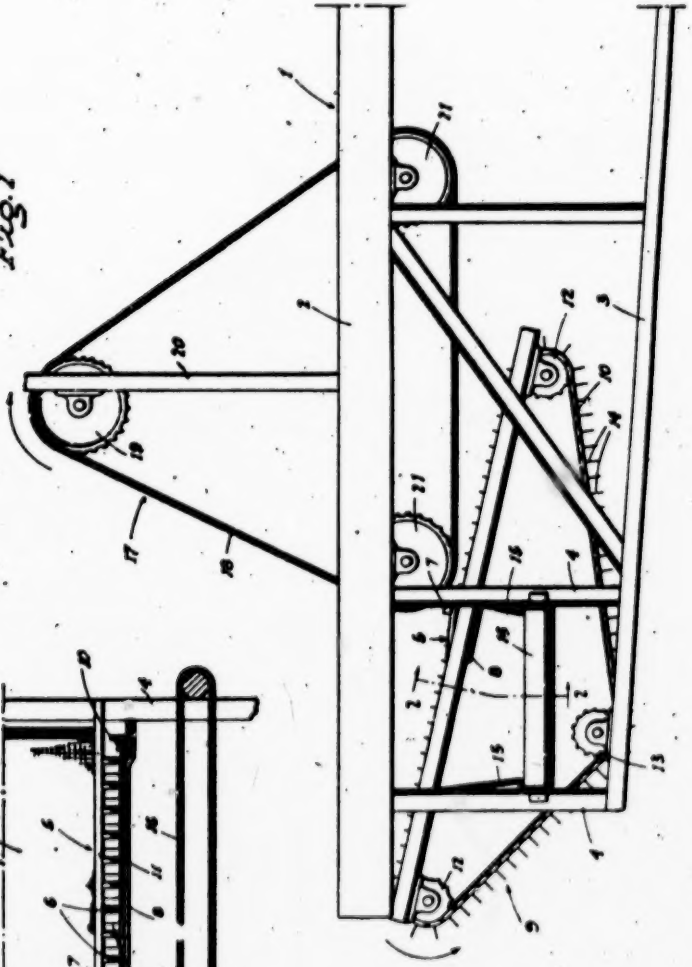

Fig. 2

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U S GOVERNMENT PRINTING OFFICE 1954